I claim:

1. A method of manufacture of an investment casting mold comprising,

mixing refractory fiber, glass fiber, and refractory filler to form a first dry blend,

mixing refractory fiber, glass fiber, and refractory filler to form a second dry blend which may be the same or different from the first dry blend,

mixing the first dry blend with an aqueous colloidal silica sol to form a refractory prime coat slurry,

mixing the second dry blend with an aqueous colloidal silica sol to form a refractory back-up coat slurry which may be the same or different from the refractory prime coat slurry,

applying a coating of the prime coat slurry onto an expendable pattern of thermoplastic material to produce a prime coated preform,

applying a stucco of refractory material onto the prime coated preform,

drying the stuccoed, prime coated preform,

applying a coating of the refractory back-up coat slurry onto the stuccoed, prime coated preform to produce a refractory back-up coated preform,

applying a stucco of refractory material onto the back-up coated preform to produce a stuccoed, back-up coated preform,

drying the stuccoed, refractory back-up coated preform,

removing the expendable pattern from the refractory back-up coated preform to produce a green shell mold, and

heating the green shell mold to a temperature sufficient to produce a fired ceramic shell mold.

2. The method of claim 1 wherein the refractory fiber is a ceramic fiber and the refractory filler includes ceramic grains which have a particle size of about 325 mesh to about 25 mesh.

3. The method of claim 2 wherein the ceramic fiber is about 1 wt.% to about 10 wt.% by weight of the dry blend,

the glass fiber is about 0.5 wt.% to about 10 wt. % by weight of the dry blend, and

the refractory filler is about 80 wt.% to about 98.5 wt. % by weight of the dry blend.

4. The method of claim 1 wherein the dry blend further includes a polymeric fiber.

5. The method of claim 4 wherein the ceramic fiber is about 1 wt.% to about 10 wt.% by weight of the dry blend,

the glass fiber is about 0.5 wt.% to about 10 wt. % by weight of the dry blend,

and the refractory filler is about 80 wt.% to about 98.5 wt. % by weight of the dry blend, and

the polymeric fiber is about 0.3 wt.% to about 4 wt.% by weight of the dry blend.

6. The method of claim 5 wherein the glass fiber is selected from the group consisting of E-glass fibers and S-glass fibers, and the polymeric fiber is selected from the group consisting of olefins, nylon type fibers, and aramid fibers.

7. The method of claim 2 wherein the refractory filler further includes rice hull ash.

8. A method of manufacture of an investment casting mold comprising,

mixing Wallastonite refractory fiber, glass fiber, and fused silica refractory filler to form a dry blend,

mixing the dry blend with an aqueous colloidal silica sol which has a solids content of 45%, a pH of 9.5 and a titratable Na_2O content of 0.2% to form a refractory prime coat slurry,

mixing the dry blend with the aqueous colloidal silica sol to form a refractory back-up coat slurry,

applying a coating of the prime coat slurry onto an expendable pattern of thermoplastic material to produce a prime coated preform,

applying a stucco of refractory material onto the prime coated preform,

drying the stuccoed, prime coated preform,

applying a coating of refractory back-up coat slurry onto the stuccoed, prime coated preform to produce a refractory back-up coated preform,

applying a stucco of refractory material onto the back-up coated preform to produce a stuccoed, back-up coated preform,

drying the stuccoed, refractory back-up coated preform,

removing the thermoplastic pattern from the refractory back-up coated preform to produce a green shell mold, and

heating the green shell mold to a temperature sufficient to produce a ceramic shell mold.

9. The process of claim 8 wherein the blend includes 100 grams Wallastonite refractory fiber, 20 grams of glass fiber, and a refractory filler that includes 1430 grams fused silica.

10. The process of claim 9 wherein the dry blend is mixed with 1000 gms of the colloidal silica sol.

11. A method of manufacture of an investment casting mold comprising,

mixing glass fiber, fused silica refractory filler and rice hull ash to form a dry blend,

mixing the dry blend with an aqueous colloidal silica sol which has a solids content of silica sol binder that has a pH of 10.5, a solids content of 40% and a titratable Na_2O content of 0.33%, an average particle size of about 40 nm, a particle size distribution of about 6 nm to about 190 nm, and a standard deviation of particle size of about 20 nm to form a refractory prime coat slurry,

mixing the dry blend with the aqueous colloidal silica sol to form a refractory back-up coat slurry,

applying a coating of the prime coat slurry onto an expendable pattern of thermoplastic material to produce a prime coated preform,

applying a stucco of refractory material onto the prime coated preform,

drying the stuccoed, prime coated preform,

applying a coating of refractory back-up coat slurry onto the stuccoed, prime coated preform to produce a refractory back-up coated preform,

applying a stucco of refractory material onto the back-up coated preform to produce a stuccoed, back-up coated preform,

drying the stuccoed, refractory back-up coated preform,

removing the thermoplastic pattern from the refractory back-up coated preform to produce a green shell mold, and

heating the green shell mold to a temperature sufficient to produce a ceramic shell mold.

12. The process of claim 11 wherein the blend includes 1430 gram fused silica, 100 grams of rice hull ash, and 20 grams of glass fiber.

13. The process of claim 12 wherein the dry blend is mixed with 1000 gms of the colloidal silica sol.

14. The product of the process of claim 10.

15. The product of the process of claim 13.

16. A method of manufacture of an investment casting mold comprising,

mixing refractory fiber and glass fiber to form a first dry blend,

mixing refractory fiber and glass fiber to form a second dry blend which may be the same or different from the first dry blend,

mixing the first dry blend with a mixture of aqueous colloidal silica sol and refractory filler to form a refractory prime coat slurry,

mixing the second dry blend with a mixture of aqueous colloidal silica sol and refractory filler an aqueous colloidal silica sol to form a refractory back-up coat slurry which may be the same or different from the refractory prime coat slurry,

applying a coating of the prime coat slurry onto an expendable pattern of thermoplastic material to produce a prime coated preform,

applying a stucco of refractory material onto the prime coated preform,

drying the stuccoed, prime coated preform,

applying a coating of the refractory back-up coat slurry onto the stuccoed, prime coated preform to produce a refractory back-up coated preform,

applying a stucco of refractory material onto the back-up coated preform to produce a stuccoed, back-up coated preform,

drying the stuccoed, refractory back-up coated preform,

removing the expendable pattern from the refractory back-up coated preform to produce a green shell mold, and

heating the green shell mold to a temperature sufficient to produce a fired ceramic shell mold.

17. The product of the process of claim 16.

18. A method of manufacture of an investment casting mold comprising,

mixing refractory fiber, glass fiber, and refractory filler to form a first dry blend,

mixing refractory fiber, glass fiber, and refractory filler to form a second dry blend which may be the same or different from the first dry blend,

mixing the first dry blend with an aqueous colloidal silica sol to form a refractory prime coat slurry,

mixing the second dry blend with an aqueous colloidal silica sol to form a refractory back-up coat slurry which may be the same or different from the refractory prime coat slurry,

applying a coating of the prime coat slurry onto an expendable pattern of thermoplastic material to produce a prime coated preform,

drying the stuccoed, prime coated preform,

applying a coating of the refractory back-up coat slurry onto prime coated preform to produce a refractory back-up coated preform,

drying the refractory back-up coated preform,

removing the expendable pattern from the refractory back-up coated preform to produce a green shell mold, and

heating the green shell mold to a temperature sufficient to produce a fired ceramic shell mold.

19. The process of example 18 wherein the refractory slurry wherein the refractory filler includes 200 mesh fused silica, 35 mesh mullite, and 48 mesh mullite.

20. The product of the process of claim 18.